

**CLAIMS**

What is claimed is:

1           1.    A multiple fan monitoring circuit for use with  
2           a plurality of fans, wherein each of said plurality of  
3           fans operates at a different frequency and generates a  
4           tach signal indicative of said fan operation, comprising:

5                a plurality of waveform shaping networks, wherein  
6           each of said plurality of waveform shaping networks is  
7           coupled to a corresponding one of said plurality of fans  
8           and utilized to waveshape a tach signal generated by said  
9           corresponding fan; and

10               a frequency processing circuit, coupled to said  
11           plurality of waveform shaping networks, that receives  
12           said waveshaped tach signals at a fan sense node.

1           2.    The multiple fan monitoring circuit as recited  
2           in Claim 1, wherein said frequency processing circuit  
3           includes:

4                a summing circuit, coupled to said fan sense node,  
5           that combines said waveshaped tach signals into a single  
6           combined signal; and

7                a frequency discriminator, coupled to said summing  
8           circuit, that separates said single combined signal into  
9           multiple components, wherein each of said multiple  
10           components corresponds to a particular fan in said  
11           plurality of fans.

1           3.    The multiple fan monitoring circuit as recited  
2           in Claim 2, wherein said frequency processing circuit  
3           further comprises an analog to digital converter.

1           4.    The multiple fan monitoring circuit as recited  
2    in Claim 2, wherein said summing circuit includes a  
3    operational amplifier (op-amp) configured as a summer.

1           5.    The multiple fan monitoring circuit as recited  
2    in Claim 1, wherein each of said plurality of waveform  
3    shaping circuits includes a resistor and a capacitor.

1           6.    The multiple fan monitoring circuit as recited  
2    in Claim 2, wherein said frequency discriminator utilizes  
3    a fast fourier transform (FFT) process to separate said  
4    single combined signal into multiple components.

1           7.    The multiple fan monitoring circuit as recited  
2    in Claim 1, wherein each of said plurality waveform  
3    shaping networks includes a blocking capacitor.

1           8. A method for monitoring a plurality of fans  
2           utilizing a single sense node, wherein each of said  
3           plurality of fans operates at a different frequency and  
4           generates a tach signal indicative of said fan operation,  
5           said method comprising:

6                 waveshaping each of said tach signals generated by  
7                 said plurality of fans;

8                 combining said waveshaped tach signals at said  
9                 single sense node into a single combined signal; and

10                separating said single combined signal into multiple  
11                components, wherein each of said multiple components  
12                corresponds to an associated fan in said plurality of  
13                fans.

1           9. The method as recited in Claim 8, wherein said  
2           waveshaping each of said tach signals includes utilizing  
3           a plurality of waveform shaping networks, wherein each of  
4           said plurality of wave form shaping networks includes a  
5           resistor and a capacitor.

1           10. The method as recited in Claim 8, further  
2           comprising converting said single combined signal into a  
3           digital form.

1           11. The method as recited in Claim 8, wherein said  
2           combining said waveshaped tach signals includes utilizing  
3           a operational amplifier configured as a summer.

1           12. The method as recited in Claim 8, wherein said  
2           separating said single combined signal includes  
3           performing a fast fourier transform (FFT) operation on  
4           said single combined signal.

1           13. The method as recited in Claim 10, wherein said  
2           converting said single combined signal includes utilizing  
3           an analog to digital converter.

100 Such as P.C.

Fig 1.

1 14. A data processing system, comprising:  
2 a processor having at least one fan sense node;  
3 a plurality of fans, wherein each of said plurality  
4 of fans operates at a different frequency and generates a  
5 tach signal indicative of said fan operation; and  
6 a multiple fan monitoring circuit, coupled to said  
7 plurality of fans, including: *200*  
8 a plurality of waveform shaping networks, *23, 240*  
9 wherein each of said plurality of waveform shaping  
10 networks is coupled to a corresponding one of said  
11 plurality of fans and utilized to waveshape a tach  
12 signal generated by said corresponding fan; and  
13 a frequency processing circuit, coupled to said  
14 plurality of waveform shaping networks, that  
15 receives said waveshaped tach signals at a fan sense  
16 node.

1 15. The data processing system as recited in Claim  
2 14, wherein said frequency processing circuit includes:  
3 a summing circuit, coupled to said fan sense node,  
4 that combines said waveshaped tach signals into a single  
5 combined signal; and  
6 a frequency discriminator, coupled to said summing  
7 circuit, that separates said single combined signal into  
8 multiple components, wherein each of said multiple  
9 components corresponds to a particular fan in said  
10 plurality of fans.

1 16. The data processing system as recited in Claim  
2 15, wherein said frequency processing circuit further  
3 comprises an analog to digital converter.

1           17. The data processing system as recited in Claim  
2           15, wherein said summing circuit includes a operational  
3           amplifier (op-amp) configured as a summer.

1           18. The data processing system as recited in Claim  
2           14, wherein each of said plurality of waveform shaping  
3           circuits includes a resistor and a capacitor.

1           19. The data processing system as recited in Claim  
2           15, wherein said frequency discriminator utilizes a fast  
3           fourier transform (FFT) process to separate said single  
4           combined signal into multiple components.

1           20. The data processing system as recited in Claim  
2           14, wherein each of said plurality waveform shaping  
3           networks includes a blocking capacitor.